Great Lakes New Invader: Bloody Red Shrimp (*Hemimysis anomala*)

183rd Species Invades the Great Lakes!

The "bloody-red shrimp" *Hemimysis anomala*, was first reported by NOAA from samples collected in Muskegon, Michigan in November of 2006 in waters connected to Lake Michigan—in excess of >1500 individuals per square meter (135 per ft^2) in swarms. It has also been found in samples taken in Lake Ontario off Oswego, New York. In both locations, adults, juveniles, and pregnant females were found, indicating that this species is reproducing in the Great Lakes. Finding the bloody red shrimp in two separate locations indicates that the species may be wide-spread, and experts expect that it will be seen in additional locations as scientists begin actively looking for it. The impact of this species on the Great Lakes is yet unknown, but based on its history of invasion across Europe, significant impacts are possible.

Microphotograph of a bloody red shrimp. Length approximately 1/4 to 1/2 inch.

Bloody red shrimp swarm visible in the shadow of a pier.

Help Needed to Document the Spread of this Species!

The bloody red shrimp prefers habitats associated with hard structures or rocky bottoms and actively avoids direct sunlight. It has a unique swarming behavior unlikely to be confused with anything else in the Great Lakes. During daylight hours, it may be observed forming reddish swarms in the shadows of piers, boats, or breakwalls. Swarms disperse at night, but in clear calm waters, the bloody red shrimp may be detected at night by shining a bright light on the water—the shrimp will rapidly swim away from the light. Please report all such observations of swarms in new locations! **www.glerl.noaa.gov/hemimysis** is being set up as an information clearinghouse to report sightings and will include instructions for sample collection and reporting. Experts will be available to confirm reports.

Stop Aquatic Hitchhikers!

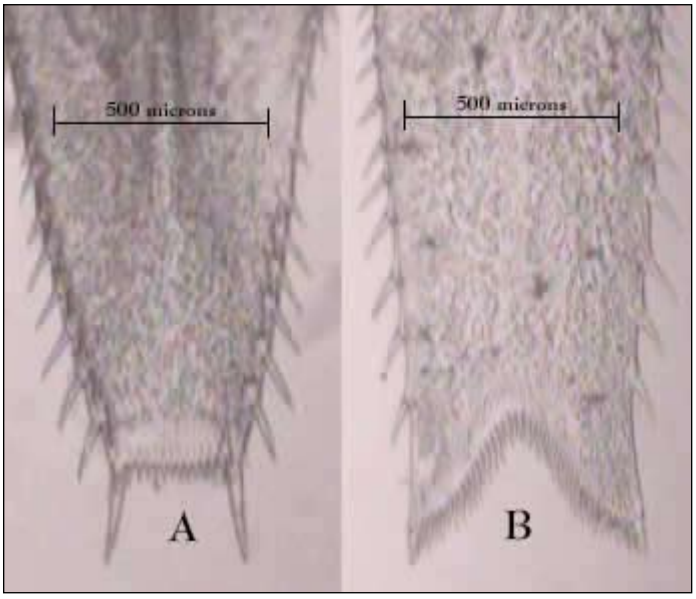
The bloody red shrimp is considered a 'high risk' for invasion of inland lakes in the Great Lakes region. Its history of invading canals, streams, lakes, and reservoirs throughout Europe also indicate the potential for significant impacts to our inland lake systems. **Do not transport live bloody red shrimp!** While these animals bear live young, juveniles are not easily visible to the naked eye. To help prevent the spread of this animal, follow the precautions outlined by the

Stop Aquatic Hitchhikers Campaign
(www.protectyourwaters.net)

NOAA Great Lakes Environmental Research Laboratory • 2205 Commonwealth Blvd, Ann Arbor, MI 48105 • 734-741-2235 • www.glerl.noaa.gov

Identification

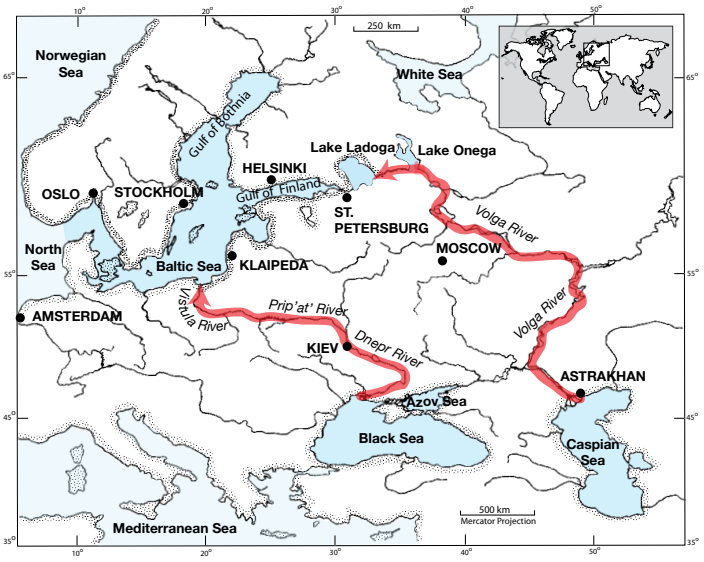
The bloody red shrimp is a mysid, a relative of the native Great Lakes opossum shrimp (*Mysis diluviana,* formerly *Mysis relicta*). Both species have stalked eyes and are generally less than 1/2 inch in length—the invader tends to be slightly smaller, though size ranges overlap. The bloody red shrimp is more red in color, and the native species is more clear, though both can be quite variable. Preserved animals tend to lose coloration. The best way to tell the two species apart is by the shape of the tail (requiring a hand lens or low magnification microscope)—the native *Mysis* has a deeply forked tail, whereas the new invader has a flat end to its tail with two prominent terminal spines. Identifications should be confirmed by an expert as several other mysid species are also invading across Europe with significant potential to become established in North America.



Telson or 'tail' of the invasive bloody red shrimp (A) and native opossum shrimp (B).

Habitat

The bloody red shrimp is most frequently found over hard bottom surfaces, including rocks and shells. It is unknown at this point whether zebra and quagga mussel beds in the Great Lakes will be suitable habitat for the shrimp. The species avoids soft bottoms and vegetation. In its native range, across Europe and in the Baltic Sea, the bloody red shrimp is found in water depths to 50 meters (166 feet). It seems to prefer slow moving waters, but has been found along rocky, wave-exposed shorelines. The shrimp is also reported to spend daylight hours hiding in rocky crevasses and boulder cavities, but has also been observed swarming in shadowed areas near the surface by day.



Native Range

The bloody red shrimp is native to the Ponto-Caspian region of eastern Europe—the same area that zebra mussels came from. Like zebra mussels, it spread across Europe, reaching the Baltic Sea in 1992 and the United Kingdom in 2004.

Life History

Bloody red shrimp have an individual lifespan of about 9 months, grow to adults in just 45 days, and can produce up to four generations per year. This lifecycle is significantly more rapid than the native opossum shrimp. Females have been documented to carry up to 66 eggs in a clutch. Broods carried by females in the Muskegon population ranged from 2 to 7.

Potential Impacts

The bloody red shrimp is an omnivore, eating a variety of smaller animals and algae. Their diet includes waterfleas and algae. They may compete with young fish, while providing food for larger fish. The invasion of this species in some European reservoirs has been documented to accelerate silica cycling, resulting in blooms of diatoms and, in some cases, plating out of silica onto pipes.

NOAA Research

The NOAA National Center for Research on Aquatic Invasive Species (NCRAIS), in Ann Arbor, is coordinating a national rapid research response to define the range, distribution, and impact of the bloody red shrimp in the Great Lakes. For more information see: http://www.glerl.noaa.gov/hemimysis

NCRAIS NATIONAL CENTER FOR RESEARCH ON AQUATIC INVASIVE SPECIES

GLERL Great Lakes Environmental Research Laboratory